IN THE CLAIMS

Please amend the claims to read a s follows:

Listing of Claims

Claims 1-25 (Canceled).

26. (New) A communication apparatus that transmits a signal with a directivity using an array antenna comprising a plurality of antennas, said communication apparatus comprising:

a generator that generates, on a per antenna basis, a transmission signal and a gain control signal for controlling a gain of the transmission signal;

a plurality of amplifiers that are disposed in one-to-one correspondence with said plurality of antennas and that each amplify the transmission signal with a gain in accordance with the gain control signal;

an attenuator that attenuates an output signal of the amplifiers;

an error detector that calculates an input-output error of the amplifiers from an input signal to the amplifiers and an output signal of the attenuator; and

a plurality of correctors that are disposed in one-to-one correspondence with said plurality of antennas and that each correct the transmission signal and the gain control signal generated by the generator so as to eliminate the error.

27. (New) The communication apparatus according to claim 26, wherein the error detector calculates a phase difference between an input signal and an output signal of an amplifier and a difference between an amplitude difference between the input signal and the output signal of the amplifier and an expected value as an input-output error of the amplifier.

28. (New) The communication apparatus according to claim 26, further comprising:

a radio frequency modulator that modulates the transmission signal generated by the generator to a radio frequency and outputting to an amplifier,

wherein the error detector calculates a phase difference between the input signal of said radio frequency modulator and the output signal of said amplifier and a difference between an amplitude difference between the input signal of said radio frequency modulator and the output signal of said amplifier, and an expected value as an input-output error of said amplifier.

29. (New) The communication apparatus according to claim 26, further comprising:

a quadrature modulator with an analog element structure that quadrature-modulates the transmission signal generated by

the generator,

wherein the error detector calculates a phase difference between the input signal of said quadrature modulator and the output signal of said amplifier and a difference between an amplitude difference between the input signal of said quadrature modulator and the output signal of said amplifier, and an expected value as an input-output error of said amplifier.

30. (New) The communication apparatus according to claim 26, further comprising:

a first frequency converter that converts signals used to calculate an input-output error of the amplifier to a same low frequency,

wherein the error detector calculates an input-output error of said amplifier from the output signal of said first frequency converter.

31. (New) The communication apparatus according to claim 26, further comprising:

a second frequency converter that converts a signal to a low frequency; and

a first switch that sequentially outputs signals used to calculate an input-output error of the amplifier to said second frequency converter,

wherein the error detector calculates an input-output error of said amplifier from the output signal of said second frequency converter.

32. (New) The communication apparatus according to claim 26, further comprising:

a first mixer that mixes the output signal and input signal of the amplifier,

wherein the error detector detects an input-output error of said amplifier from the output signal of said first mixer.

33. (New) The communication apparatus according to claim 26, further comprising:

a radio frequency modulator that modulates the transmission signal generated by the generator to a radio frequency and outputting to the amplifier;

a second mixer that mixes the input signal of said radio frequency modulator and the output signal of said amplifier; and

a third frequency converter that converts the frequency of the output signal of said second mixer to 0,

wherein the error detector detects an input-output error of said amplifier from the output signal of said third frequency converter.

34. (New) The communication apparatus according to claim 26, further comprising:

an attenuator that attenuates the output signal of the amplifier according to a gain control signal,

wherein the error detector calculates an input-output error of said amplifier using the signal attenuated by said first attenuator.

35. (New) The communication apparatus according to claim 26, further comprising:

a plurality of amplifiers and antennas that emit the output signals of the amplifiers,

wherein when the generator generates transmission signals and gain control signals corresponding to said amplifiers, said plurality of antennas multiply said transmission signals and gain control signals by coefficients to form a directivity.

36. (New) The communication apparatus according to claim 35, further comprising a switch that sequentially outputs signals

used to calculate an input-output error of the amplifier to the error detector.

37. (New) The communication apparatus according to claim 26, wherein the corrector converts a corrected transmission signal and gain control signal to an analog signal and the error detector converts the input signal to a digital signal.

38. (New) The communication apparatus according to claim 26, further comprising:

an amplitude/phase characteristic storage that stores the amplitude/phase characteristic of the transmission signal versus the gain of the amplifier based on the output signal and gain control signal of the error detector in a calibration table,

wherein the corrector corrects the transmission signal and gain control signal based on the content of said calibration table.

39. (New) The communication apparatus according to claim 38, further comprising a forced changer that forcibly changes a power value and an amplification value of the transmission signal generated by the generator so that a product of said power value and said amplification value becomes a predetermined value.

40. (New) A communication apparatus that receives a signal with a directivity from an array antenna comprising a plurality of antennas, said communication apparatus comprising:

a same number of radio apparatuses that each amplify a reception signal to a fixed amplitude by auto-gain control and quadrature-modulate the amplified signal;

a calibration apparatus in a same configuration as that of the radio apparatuses;

an error detector that calculates amplitude and phase errors between auto-gain control signals and demodulated signals output from said radio apparatuses and an auto-gain control signal and demodulated signal output from said calibration apparatus; and

a corrector that corrects the amplitude and phase of said auto-gain control signals and demodulated signals output from said radio apparatuses so as to eliminate said errors.

41. (New) A communication apparatus comprising:

a plurality of radio apparatuses that amplify a reception signal to a fixed amplitude by auto-gain control and quadrature-modulate the amplified signal;

a calibration apparatus that amplifies said reception signal to a fixed amplitude by auto-gain control and mixes this amplified signal with a signal amplified by any one of said radio

apparatuses;

an error detector that calculates amplitude and phase errors between the signal amplified by each of said radio apparatuses and the signal amplified by said calibration apparatus based on said mixed signal and calculating amplitude and phase errors between the auto-gain control signal output from each of said radio apparatuses and the auto-gain control signal output from said calibration apparatus; and

a corrector that corrects the amplitude and phase of the auto-gain control signal and demodulated signal output from each of said radio apparatuses so as to eliminate said errors.

42. (New) The communication apparatus according to claim 40, further comprising:

an amplitude/phase characteristic storage that stores amplitude/phase characteristics of the reception signal with respect to the gain of the amplifier in a calibration table based on the output signal and auto-gain control signal of the error detector,

wherein the corrector corrects the demodulated signal and auto-gain control signal based on the content of said calibration table.

43. (New) The communication apparatus according to claim 42, further comprising a forced changer that forcibly changes a power value and an amplification value of the demodulated signal corrected by the corrector so that a product of said power value and said amplification value becomes a predetermined value.

44. (New) The communication apparatus according to claim 40, further comprising:

a first despreader that performs despreading processing on each auto-gain control signal and demodulated signal output from each of a plurality of radio apparatuses;

a second despreader that performs despreading processing on the auto-gain control signal and demodulated signal output from the calibration apparatus;

a first symbol correlator that finds a symbol correlation value of the output signal of said first despreader; and

a second symbol correlator that finds a symbol correlation value of the output signal of said second despreader,

wherein said detector calculates amplitude and phase errors between the output signal of said first symbol correlator and the output signal of said second symbol correlator.

45. (New) The communication apparatus according to claim 40, further comprising:

a third despreader that performs despreading processing on the auto-gain control signal and demodulated signal output from each of a plurality of radio apparatuses for each user; and

a fourth despreader that performs despreading processing on the auto-gain control signal and demodulated signal output from the calibration apparatus for each user,

wherein the error detector calculates amplitude and phase errors between the output signal of said third despreader and the output signal of said fourth despreader on each radio apparatus for each user and selects the errors of the user with the optimal condition for each radio apparatus.

46. (New) The communication apparatus according to claim 40, further comprising:

a third despreader that performs despreading processing on the auto-gain control signal and demodulated signal output from each of a plurality of radio apparatuses for each user; and

a fourth despreader that performs despreading processing on the auto-gain control signal and demodulated signal output from the calibration apparatus for each user,

wherein the error detector calculates amplitude and phase errors between the output signal of said third despreader and the output signal of said fourth despreader on each radio apparatus for each user and combines errors of all users for each radio apparatus.

47. (New) The communication apparatus according to claim 45, further comprising:

a third symbol correlator that finds a symbol correlation value of the output signal of the third despreader; and

a fourth symbol correlator that finds a symbol correlation value of the output signal of the fourth despreader,

wherein the error detector calculates amplitude and phase errors between the output signal of said third symbol correlator and the output signal of said fourth symbol correlator.

48. (New) A base station apparatus comprising a communication apparatus that transmits a signal with a directivity using an array antenna comprising a plurality of antennas, said communication apparatus comprising:

a generator that generates, on a per antenna basis, a transmission signal and a gain control signal for controlling a gain of the transmission signal;

a plurality of amplifiers that are disposed in one-to-one correspondence with said plurality of antennas and that each amplify the transmission signal with a gain in accordance with the gain control signal;

an attenuator that attenuates an output signal of the amplifiers;

an error detector that calculates an input-output error of the amplifiers from an input signal to the amplifiers and an output signal of the attenuator; and

a plurality of correctors that are disposed in one-to-one correspondence with said plurality of antennas and that each correct the transmission signal and the gain control signal generated by the generator so as to eliminate the error.

49. (New) A base station apparatus comprising a communication apparatus, said communication apparatus comprising:

a radio apparatuses that amplify a reception signal to a fixed amplitude by auto-gain control and quadrature-modulate the amplified signal;

a calibration apparatus in a same configuration, as that of these radio apparatuses;

an error detector that calculates amplitude and phase errors between the auto-gain control signal and demodulated signal

output from said radio apparatuses and the auto-gain control signal and demodulated signal output from said calibration apparatus; and

a corrector that corrects the amplitude and phase of said auto-gain control signal and demodulated signal output from each of said radio apparatuses.

50. (New) A communication method in a communication apparatus that transmits a signal with a directivity using an array antenna comprising a plurality of antennas, said communication method comprising the steps of:

generating a transmission signal and a gain control signal for controlling a gain of the transmission signal on a per antenna basis;

in a same number of amplifiers as the antennas, amplifying the transmission signal with a gain in accordance with the gain control signal;

in an attenuator, attenuating an output signal of the amplifiers;

calculating an input-output error of the amplifiers from an input signal to the amplifiers and an output signal of the attenuator; and

correcting the transmission signal and the gain control signal so as to eliminate the error.

51. (New) A communication method in a communication apparatus that
receives a signal with a directivity using an array antenna comprising a plurality of antennas, said communication method comprising the steps of:

in a same number of radio apparatuses as the antennas, amplifying a reception signal to a fixed amplitude by auto-gain control and quadrature-modulating the amplified signal;

in a calibration apparatus in a same configuration as that of the radio apparatus, performing calibration;

calculating amplitude and phase errors between auto-gain control signals and demodulated signals output from said radio apparatuses and an auto-gain control signal and demodulated signal output from said calibration apparatus; and

correcting the amplitude and phase of said auto-gain control signals and demodulated signals output from said radio apparatuses so as to eliminate said errors.